

What is claimed is:

1. An inspection method of an electric part comprising the steps of:

storing a plurality of images of a non-defective electric part in advance; and

judging whether or not an electric part to be inspected is non-defective on the basis of an image of the electric part to be inspected and a plurality of the images of a non-defective electric part.

2. An inspection method of an electric part comprising the steps of:

storing a plurality of images of a non-defective electric part in advance;

comparing an image of an electric part to be inspected and a plurality of the images of a non-defective electric part;

extracting an image most analogous to the image of an electric part to be inspected from a plurality of the images of a non-defective electric part; and

judging whether or not the electric part to be inspected is non-defective on the basis of the most analogous image and the image of the electric part to be inspected.

3. An inspection apparatus of an electric junction box having a plurality of mounts on which electric parts are mounted, for inspecting mounting state of the electric parts, said each electric part having a different mark on an outer surface thereof depending upon an item symbol thereof, the inspection apparatus comprising:

image pickup means for picking up an image including said mark of the electric part mounted on the mount;

extraction means for (1) storing image consulting data containing a

plurality of images including said marks of the electric parts of all the item symbols to be mounted in the electric junction box as a subject of the inspection and normal data indicating the proper item symbols of the electric parts mounted on the corresponding mounts, and for (2) comparing the image including said mark of the electric part mounted on the mount picked up by the image pickup means and the image in the image consulting data, and for (3) extracting the item symbol of the electric part having the most analogous image from the images in the image consulting data; and

judgment means for judging the quality of the mounting state of the electric parts on the mount by comparing the item symbol of the electric part having the most analogous image and said normal data.

4. The inspection apparatus of an electric junction box according to claim 3, wherein the image is a digital information, in which an optical power is indicated with a plurality of grades thereof,

the extraction means compares the image including said mark of the electric part mounted on the mount in the electric junction box as a subject of the inspection and the image in the image consulting data by a method of normalization correlation so that the image having the highest correlation value obtained by the method of normalization correlation out of the images is set up to be said most analogous image, and

the judgment means judges the quality of the mounting state of the electric parts on the mount by comparing the item symbol of the electric part of the image having the highest correlation value and said normal data.

5. An inspection apparatus of an electric junction box having a

plurality of mounts on which electric parts are mounted, for inspecting mounting state of the electric parts, said each electric part having a different mark on an outer surface thereof depending upon an item symbol thereof, the inspection apparatus comprising:

image pickup means for picking up an image including said mark of the electric part mounted on the mount;

extraction means for (1) storing image consulting data containing a plurality of images including said marks of the electric parts of all the item symbols to be mounted in the electric junction box as a subject of the inspection, and for (2) comparing the image including said mark of the electric part mounted on the mount picked up by the image pickup means and the image of the electric part having the proper item symbol to be mounted in the image consulting data by a method of normalization correlation, and for (3) extracting the highest correlation value out of the correlation values obtained by the method of normalization correlation; and

judgment means for judging the quality of the mounting state of the electric parts on the mount on the basis of the highest correlation value.

6. The inspection apparatus of an electric junction box according to claim 4 or 5, wherein the judgment means adds the image including said mark of the electric part properly mounted on the mount, out of the electric parts judged improperly mounted on the mount, to the image consulting data.

7. An inspection apparatus of a terminal fittings for inspecting mounting state of the terminal fittings on an insulator, said terminal fittings being mounted on the insulator and an electric wire being

pressure-welded to the terminal fittings, the inspection apparatus comprising:

image pickup means for picking up an image of the terminal fittings mounted on the insulator;

extraction means for (1) storing image consulting data containing a plurality of images of a non-defective terminal fittings mounted on the insulator, and for (2) comparing the image of the terminal fittings picked up by the image pickup means and a plurality of the images of a non-defective terminal fittings in the image consulting data, and for (3) extracting an image most analogous to the image of the terminal fittings picked up by the image pickup means from the images in the image consulting data; and

judgment means for judging the quality of the mounting state of the terminal fittings on the insulator by comparing the most analogous image and the image of the terminal fittings picked up by the image pickup means.

8. The inspection apparatus of a terminal fittings according to claim 7, wherein the image is a digital information, in which an optical power is indicated with a plurality of grades thereof,

the extraction means compares the image of the terminal fittings picked up by the image pickup means and a plurality of the image in the image consulting data by a method of normalization correlation so that the image having the highest correlation value obtained by the method of normalization correlation out of the images is set up to be said most analogous image, and

the judgment means judges the quality of the mounting state of the

terminal fittings on the insulator to be good when the correlation value is equal to or higher than a predetermined threshold while judges the quality of the mounting state to be no good when the correlation value is lower than the predetermined threshold.

9. An inspection apparatus of a terminal fittings for inspecting pressure-welding state of an electric wire to the terminal fittings, said terminal fittings being mounted on an insulator and the electric wire being pressure-welded to the terminal fittings, the inspection apparatus comprising:

image pickup means for picking up an image of the terminal fittings, to which the electric wire is pressure-welded, mounted on the insulator;

second extraction means for (1) storing second image consulting data containing a plurality of images of a non-defective terminal fittings, to which the electric wire is pressure-welded, mounted on the insulator, and for (2) comparing the image of the terminal fittings, to which the electric wire is pressure-welded, picked up by the image pickup means and a plurality of images of a non-defective terminal fittings, to which the electric wire is pressure-welded, in the second image consulting data, and for (3) extracting an image most analogous to the image of the terminal fittings, to which the electric wire is pressure-welded, picked up by the image pickup means from the images in the second image consulting data; and

second judgment means for judging the quality of the pressure-welding state of the electric wire to the terminal fittings, to which the electric wire is pressure-welded, mounted on the insulator by comparing the most analogous image and the image of the terminal fittings, to

which the electric wire is pressure-welded, mounted on the insulator picked up by the image pickup means.

10. The inspection apparatus of a terminal fittings according to claim 9, wherein the image is a digital information, in which an optical power is indicated with a plurality of grades thereof,

the second extraction means compares the image of the terminal fittings, to which the electric wire is pressure-welded, picked up by the image pickup means and a plurality of the images in the second image consulting data by a method of normalization correlation so that the image having the highest correlation value obtained by the method of normalization correlation out of the images is set up to be said most analogous image, and

the second judgment means judges the quality of the pressure-welding state of the electric wire to the terminal fittings to be good when the correlation value is equal to or higher than a predetermined threshold while judges the quality of the pressure-welding state to be no good when the correlation value is lower than the predetermined threshold.

11. An inspection apparatus of a terminal fittings for inspecting mounting state of the terminal fittings on an insulator and pressure-welding state of an electric wire, said terminal fittings being mounted on the insulator and the electric wire being pressure-welded to the terminal fittings, the inspection apparatus comprising:

image pickup means for picking up an image of the terminal fittings mounted on the insulator;

extraction means for (1) storing image consulting data containing a plurality of images of a non-defective terminal fittings mounted on the

insulator, and for (2) comparing the image of the terminal fittings picked up by the image pickup means and a plurality of the images of a non-defective terminal fittings in the image consulting data, and for (3) extracting an image most analogous to the image of the terminal fittings picked up by the image pickup means from the images in the image consulting data;

judgment means for judging the quality of the mounting state of the terminal fittings on the insulator by comparing the most analogous image and the image of the terminal fittings picked up by the image pickup means;

second extraction means for (1) storing second image consulting data containing a plurality of images of a non-defective terminal fittings, to which the electric wire is pressure-welded, mounted on the insulator, and for (2) comparing the image of the terminal fittings, to which the electric wire is pressure-welded, picked up by the image pickup means and a plurality of images of a non-defective terminal fittings, to which the electric wire is pressure-welded, in the second image consulting data, and for (3) extracting an image most analogous to the image of the terminal fittings, to which the electric wire is pressure-welded, picked up by the image pickup means from the images in the second image consulting data; and

second judgment means for judging the quality of the pressure-welding state of the electric wire to the terminal fittings, to which the electric wire is pressure-welded, mounted on the insulator by comparing the most analogous image and the image of the terminal fittings, to which the electric wire is pressure-welded, mounted on the insulator

picked up by the image pickup means.

12. The inspection apparatus of a terminal fittings according to claim 11, wherein the image is a digital information, in which an optical power is indicated with a plurality of grades thereof,

the extraction means compares the image of the terminal fittings picked up by the image pickup means and a plurality of the image in the image consulting data by a method of normalization correlation so that the image having the highest correlation value obtained by the method of normalization correlation out of the images is set up to be said most analogous image,

the judgment means judges the quality of the mounting state of the terminal fittings on the insulator to be good when the correlation value is equal to or higher than a predetermined threshold while judges the quality of the mounting state to be no good when the correlation value is lower than the predetermined threshold,

the second extraction means compares the image of the terminal fittings, to which the electric wire is pressure-welded, picked up by the image pickup means and a plurality of the images in the second image consulting data by a method of normalization correlation so that the image having the highest correlation value obtained by the method of normalization correlation out of the images is set up to be said most analogous image, and

the second judgment means judges the quality of the pressure-welding state of the electric wire to the terminal fittings to be good when the correlation value is equal to or higher than a predetermined threshold while judges the quality of the pressure-welding state to be no good



when the correlation value is lower than the predetermined threshold.

13. The inspection apparatus of a terminal fittings according to claim 7, 8, 11 or 12, wherein the terminal fittings has a pressure-welding part to which the electric wire is pressure-welded and a caulking piece for caulking the electric wire,

the image pickup means picks up at least one image out of an image of the pressure-welding part and that of the caulking piece,

the image consulting data includes at least one plurality of images out of images of the pressure-welding part and those of the caulking piece, and

the extraction means compares at least one image out of an image of the pressure-welding part and that of the caulking piece, which are picked up by the image pickup means, with at least one plurality of images out of images of the pressure-welding part and those of the caulking piece, which are included in the image consulting data.

14. The inspection apparatus of a terminal fittings according to claim 9, 10, 11 or 12, wherein the terminal fittings has a pressure-welding part to which the electric wire is pressure-welded and a caulking piece for caulking the electric wire,

the image pickup means picks up at least one image out of an image of the pressure-welding part to which the electric wire was pressure-welded and that of the caulking piece which caulked the electric wire,

the second image consulting data includes at least one plurality of images out of images of the pressure-welding part to which the electric wire was pressure-welded and those of the caulking piece which caulked the electric wire, and

the extraction means compares at least one image out of an image of the pressure-welding part to which the electric wire was pressure-welded and that of the caulking piece which caulked the electric wire, which are picked up by the image pickup means, with at least one plurality of images out of images of the pressure-welding part to which the electric wire was pressure-welded and those of the caulking piece which caulked the electric wire, which are included in the second image consulting data.